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SEQUENCE LISTING

<110> National Research Council of Canada
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<120> Glycosyltransferases of Helicobacter pylori as a new
target in prevention and treatment of H. pylori
infections

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<150> 60/140,820

<151> 1999-06-28

<160> 16

<170> PatentIn Ver. 2.1

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<212> DNA

<213> Helicobacter pylori

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 Lys Cys Ile Glu Leu Asn Glu Ala Ile Cys Ile Leu Glu Asp Asp Ile
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Glu His Pro Gln Ser Gln Asn Asp Ser Glu Lys Leu Phe Tyr Lys Ile
      35             40             45

His Cys Leu Val Asp Asn Leu Ser Leu Glu Asn Gln Ser Lys Leu Lys
      50             55             60

Glu Thr Leu Ala Pro Phe Ser Ala Phe Ser Ser Leu Glu Phe Leu Asp
      65             70             75             80

Ile Ser Thr Pro Asn Leu His Ala Thr Pro Ile Glu Pro Ser Ala Ile
      85             90             95

Asp Lys Ile Asn Glu Ala Phe Leu Gln Leu Asn Ile Tyr Ala Lys Thr
     100             105             110

Arg Phe Ser Lys Met Val Met Cys Arg Leu Phe Leu Ala Ser Leu Phe
     115             120             125

Pro Gln Tyr Asp Lys Ile Ile Met Phe Asp Ala Asp Thr Leu Phe Leu
     130             135             140

Asn Asp Val Ser Glu Ser Phe Phe Ile Pro Leu Asp Gly Tyr Tyr Phe
     145             150             155             160

Gly Ala Ala Lys Asp Phe Ala Ser Asp Lys Ser Pro Lys His Phe Gln
     165             170             175

Ile Val Arg Glu Lys Asp Pro Arg Gln Ala Phe Ser Leu Tyr Glu His
     180             185             190

Tyr Leu Asn Glu Ser Asp Met Gln Ile Ile Tyr Glu Ser Asn Tyr Asn

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| Glu Glu Arg Leu Leu Asn Leu Thr His Gln Lys Gly Gln Cys Val Phe | | |
| 225 | 230 | 235 240 |
| Tyr Pro Glu Gln Asp Leu Leu Thr Leu Ala Cys Tyr Gln Lys Val Leu | | |
| | 245 | 250 255 |
| Ile Leu Pro Tyr Ile Tyr Asn Thr His Pro Phe Met Ala Asn Gln Lys | | |
| | 260 | 265 270 |
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| | 275 | 280 285 |
| Val Gly Lys Pro Trp Val Leu Pro Thr Phe Ser Tyr Ser Lys Glu Trp | | |
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| His Glu Thr Leu Leu Lys Thr Pro Phe Tyr Ala Glu Tyr Ser Val Lys | | |
| | 305 | 310 315 320 |
| Phe Leu Lys Gln Met Thr Glu Cys Leu Ser Leu Lys Asp Lys Gln Lys | | |
| | 325 | 330 335 |
| Thr Phe Glu Phe Leu Ala Pro Leu Leu Asn Lys Lys Thr Leu Leu Glu | | |
| | 340 | 345 350 |
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Leu Gly Thr Arg Leu Thr Leu Lys Ile Ala Lys Leu Leu Glu Cys Glu
      35              40              45

Lys His Phe Glu Ile Ile Pro Leu Phe Glu Asn Val Pro Ala Phe Tyr
      50              55              60

Asp Leu Lys Lys Gln Gly Val Phe Leu Ala Met Lys Asp Phe Leu Trp
      65              70              75              80

Leu Leu Lys Ala Ile Lys Lys His Gln Ile Lys Arg Leu Ile Leu Glu
      85              90              95

Lys Gln Asp Phe Arg Ser Thr Phe Leu Ala Lys Phe Ile Pro Ile Thr
      100              105              110

Thr Pro Asn Lys Glu Ile Lys Asn Val Tyr Gln Asn Arg Gln Glu Leu
      115              120              125

Phe Ser Gln Ile Tyr Gly His Val Phe Asp Asn Pro Pro Tyr Pro Met
      130              135              140

Asn Leu Lys Asn Pro Lys Lys Ile Leu Ile Asn Pro Phe Thr Arg Ser
      145              150              155              160

Ile Asp Arg Ser Ile Pro Leu Glu His Leu Gln Ile Val Leu Lys Leu
      165              170              175

Leu Lys Pro Phe Cys Val Thr Leu Leu Asp Phe Glu Glu Arg Tyr Ala
      180              185              190

Phe Leu Lys Asp Arg Val Ala His Tyr Arg Ala Lys Thr Ser Leu Glu
      195              200              205

Glu Val Lys Asn Leu Ile Leu Glu Ser Asp Leu Tyr Ile Gly Gly Asp
      210              215              220

Ser Phe Leu Ile His Leu Ala Tyr Tyr Leu Lys Lys Asn Tyr Phe Ile
      225              230              235              240

Phe Phe Tyr Arg Asp Asn Asp Asp Phe Met Pro Pro Asn Ser Lys Asn
      245              250              255

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35 40 45
Thr Cys Glu Leu Phe Lys Lys Asp Glu Lys Ile Glu Ala Val Phe Ile
50 55 60
Asp Asn Thr Lys Lys Ser Phe Phe Arg Leu Leu Ala Ile His Lys Leu
65 70 75 80
Ala Gln Lys Ile Gly Arg Cys Asp Ile Ala Ile Thr Leu Asn Asn His
85 90 95
Phe Tyr Ser Ala Phe Leu Leu Tyr Ala Thr Lys Thr Pro Val Arg Ile
100 105 110

Gly Phe Ala Gln Phe Phe Arg Ser Leu Phe Leu Ser His Ala Ile Ala
 115 120 125
 Pro Ala Pro Lys Glu Tyr His Gln Val Glu Lys Tyr Cys Phe Leu Phe
 130 135 140
 Ser Gln Phe Leu Glu Lys Glu Leu Asp Gln Lys Ser Val Leu Pro Leu
 145 150 155 160
 Lys Leu Ala Phe Asn Leu Pro Thr His Thr Pro Asn Thr Pro Lys Lys
 165 170 175
 Ile Gly Phe Asn Pro Ser Ala Ser Tyr Gly Ser Ala Lys Arg Trp Pro
 180 185 190
 Ala Ser Tyr Tyr Ala Glu Val Ser Ala Val Leu Leu Glu Lys Gly His
 195 200 205
 Glu Ile Tyr Phe Phe Gly Ala Lys Glu Asp Ala Ile Val Ser Glu Glu
 210 215 220
 Ile Leu Lys Leu Ile Lys Gly Ser Leu Lys Asn Pro Ser Leu Phe His
 225 230 235 240
 Asn Ala Tyr Asn Leu Cys Gly Lys Thr Ser Ile Glu Glu Leu Ile Glu
 245 250 255
 Arg Ile Ala Val Leu Asp Leu Phe Ile Thr Asn Asp Ser Gly Pro Met
 260 265 270
 His Val Ala Ala Ser Met Gln Thr Pro Leu Ile Ala Leu Phe Gly Pro
 275 280 285
 Thr Asp Glu Lys Glu Thr Arg Pro Tyr Lys Ala Gln Lys Thr Ile Val
 290 295 300
 Leu Asn His His Leu Ser Cys Ala Pro Cys Lys Lys Arg Val Cys Pro
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Thr His His Gln Val Gln Ile Phe Asp Ala Ile Tyr Ser Lys Thr Phe
      35             40             45

Glu Gly Gly Leu His Pro Leu Val Lys Lys His Leu His Pro Tyr Phe
      50             55             60

Ile Thr Gln Asn Ile Lys Asp Met Gly Ile Thr Thr Ser Leu Ile Ser
      65             70             75             80

Glu Val Ser Lys Phe Tyr Tyr Ala Leu Lys Tyr His Ala Lys Phe Met
      85             90             95

Ser Leu Gly Glu Leu Gly Cys Tyr Ala Ser His Tyr Ser Leu Trp Glu
      100            105            110

Lys Cys Ile Glu Leu Asn Glu Ala Ile Cys Ile Leu Glu Asp Asp Ile
      115            120            125

Thr Leu Lys Glu Asp Phe Lys Glu Gly Leu Asp Phe Leu Glu Lys His
      130            135            140

Ile Gln Glu Leu Gly Tyr Val Arg Leu Met His Leu Leu Tyr Asp Pro
      145            150            155            160

Asn Ile Lys Ser Glu Pro Leu Asn His Lys Asn His Glu Ile Gln Glu
      165            170            175

Arg Val Gly Ile Ile Lys Ala Tyr Ser Glu Gly Val Gly Thr Gln Gly
      180            185            190

Tyr Val Ile Thr Pro Lys Ile Ala Lys Val Phe Lys Lys His Ser Arg
      195            200            205

Lys Trp Val Val Pro Val Asp Thr Ile Met Asp Ala Thr Phe Ile His
      210            215            220

Gly Val Lys Asn Leu Val Leu Gln Pro Phe Val Ile Ala Asp Asp Glu
      225            230            235            240

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<211> 1120

<212> DNA

<213> Helicobacter pylori

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<213> Helicobacter pylori

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35 40 45
His Cys Leu Val Asp Asn Leu Ser Leu Glu Asn Gln Cys Lys Leu Lys
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<210> 13
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<212> DNA

<213> *Helicobacter pylori*

<400> 13

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<212> PRT

<213> *Helicobacter pylori*

<400> 14

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          20           25           30

Leu Gly Thr Arg Leu Thr Leu Lys Ile Ala Lys Leu Leu Glu Cys Glu
          35           40           45

Lys His Phe Glu Ile Ile Pro Val Phe Lys Asn Ile Pro Ala Phe Tyr
          50           55           60

Asp Leu Lys Lys Gln Gly Val Phe Trp Ala Met Lys Asp Phe Leu Trp
          65           70           75           80

Leu Leu Lys Ala Leu Lys Lys His Lys Ile Lys His Leu Ile Leu Glu
          85           90           95

Lys Gln Asp Phe Arg Ser Ala Leu Leu Ser Lys Phe Val Ser Ile Thr
          100          105          110

Thr Pro Asn Lys Glu Ile Lys Asn Ala Tyr Gln Asn Arg Gln Glu Leu
          115          120          125

Phe Ser Gln Ile Tyr Gly His Val Phe Asp Asn Ser Gln Tyr Ser Met
          130          135          140

Ser Leu Lys Asn Pro Lys Lys Ile Leu Ile Asn Pro Phe Thr Arg Glu
          145          150          155          160

Asn Asn Arg Asn Ile Ser Leu Glu His Leu Gln Ile Val Leu Lys Leu
          165          170          175

Leu Lys Pro Phe Cys Val Thr Leu Leu Asp Phe Glu Glu Arg Tyr Ala
          180          185          190

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Ser Phe Leu Ile His Leu Ala Tyr Tyr Leu Lys Lys Asn Tyr Phe Ile
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Phe Phe Tyr Arg Asp Asn Asp Asp Phe Met Pro Pro Lys Asn Glu Asn
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Leu Gly Thr Arg Leu Thr Leu Lys Ile Ala Lys Leu Leu Glu Cys Glu
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Lys His Phe Glu Ile Ile Pro Ile Phe Glu Asn Ile Pro Ala Phe Tyr
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Asp Leu Lys Lys Gln Gly Val Phe Trp Ala Met Lys Asp Phe Leu Trp
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